REVISED: 11/12
SUPERSEDES: 1/12

"G" SERIES

!! BEFORE A SUSPECT COMPRESSOR IS REMOVED, ALWAYS CHECK LOCKED ROTOR PULL-DOWN VOLTAGE !!
SEE PAGE 4 FOR DETAILS

INSTALLATION AND SERVICE INSTRUCTIONS

AIR CONDITIONING/HEAT PUMP COMPRESSORS

Bristol Compressors International Inc.

CAUTION: Bristol compressors are completely interchangeable with other manufacturers. However, electrical specifications, tubing configurations, and wiring connections may vary. Before installing and starting this compressor, you must review the wiring diagrams and check for correct electrical components.

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Index

Page

Cover Sheet 1

Index 2

Compressor Model Number System 3
(Refer to cross-reference table on page 25 for H22G USA Service Models to Standard "G" compressors)

Before Condemning a Compressor that Fails to Start 4

Installation Procedures After Compressor has Been Verified as Faulty ..... 4 - 9

Worst Case Condition Checks 8

How to Check Superheat 9

Check Filter Driers for Contamination 9

Module Electrical Schematics and Other Information
- Summary of Electronic Modules 10
- AE, 31AA, 41AA or INT 369R Protection Modules (Parallel Sensors) Dual Power Terminal, Full and Part Winding Start Models 11
- AE, 31AA, 41AA or INT 369R Protection Modules (Parallel Sensors) Dual Power Terminal (WYE-Delta) Models 12
- AE, 31AA, 41AA or INT 369R Protection Modules (Parallel Sensors) Single Power Terminal Models 13
- AE, 30AA, 40AA or INT 169R Protection Modules (Series Sensors) Single Power Terminal Models 14
- AE, 31AA, 41AA or INT 369R Modules (Parallel Sensors) Two-Speed Models 15
- AE, 30AA, 40AA or INT 169R Modules (Series Sensors) Two-Speed Models 16
- "G" Series Internal Line Break Models 17
- Housing Configuration Comparison 17
- Replacing Module Protected Compressor with Line Break Compressor 17-18
- Wiring a Two-Speed "G" for Single-Speed Operation 19

Parts and Accessories for "G" Series Compressors 20

Rotalock Adapters and Valve Part Numbers and Drawings 21

Compressor Mounting Information 22

Compressor Housing Tilt Angle 22

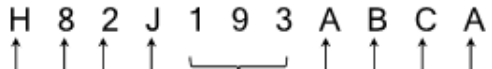
Explanation of the European Pressure Equipment Directive (PED) 22

Pressure-Temperature Relation Chart 23-24

H22G Cross-Reference Table to H*NG, H*BG and H*5G Models 25

WARNING: Cannot use ICM parallel motor protection modules, part numbers 241730 or 241731, with Kriwan sensors (cold resistance of 30-100 ohms for parallel sensors) because the modules have "shorted sensor protection" that does not allow operation below 500 ohms.

COMPRESSOR MODEL NUMBER SYSTEM



Mounting Feet Dimension (Inches)....

A = 7.5 x 7.5	E = 9.5 x 9.5	K = 7.5 x 17	Y = 7.5 x 7.75
B = 4.8 x 8.0	F = 10.5 x 10.5	L = Offset Mounting Rail	
C = 8.44 x 9.75	H = 7.5 x 21.5	R = Horizontal/Vertical Mount	
D = 6.12 x 8.0	J = 7.5 x 22.5	X = 8.8 x 6.1	

Electrical Characteristics.....

A = 115-1-60	G = 230-1-50	P = 200/240-1-50	Y = 230/208-3-60
B = 230-1-60	H = 265-1-60 (220/240-1-50)	T = 208-1-60	Z = 380/415-3-50
C = 230/208-1-60	J = 230/208-1-50	U = 220/380-3-60	2 = 180-3-120
D = 230/208-3-60 (220/200-3-50)	K = 220/240-1-50	V = 460/380-3-60 (380/415-3-50)	
E = 460-3-60 (380/415-3-50)	L = 230/200-3-60 (220/200-3-50)	W = 380/460-3-60	
F = 575-3-60 (500-3-50)	M = 220/200-3-50	X = 380-3-60	

Motor Protector.....

B = Internal Line Break
P = Pilot Duty - Solid State
R = Pilot Duty - Solid State (2nd Generation)
T = Pilot Duty - Internal Thermostat and External Sensing Elements

Motor Type.....

A = PSC Permanent Split Capacitor	F = PWS 3 Phase-Part Winding Start	M = 3 Phase Variable Speed Permanent Magnet
B = CSR Capacitor Start/Cap. Run	G = 3 Phase 2/4 Pole (2 Speed)	
C = RSCR Resistance Start/Cap. Run	J = 1 Phase 2/4 Pole (2 Speed)	
D = AL 3 Phase-Across the Line	K = 3 Phase Dual Voltage	
E = CSIR Cap. Start/Induction Run	L = 3 Phase - WYE DELTA	

Nominal Capacity (BTU/Hr).....

193 = 19+000 or 19,000 BTU/Hr; 244 = 24+0,000 or 240,000 BTU/Hr
19B = 19+000 Internal bleed applied for equalized start
Note: A letter (E, Q, S, T or U) in the third position also indicates k+000

Family.....

A = Model A Reciprocating	G = Model G Reciprocating
B = Model B Reciprocating	J = Benchmark Model Reciprocating
C = Scroll (<42k)	R = Scroll (>42k)
D = Dual Compressor Application	

Generation.....

B = Second Generation - No PRV (Except G Series)	2 = Third Generation - Basic Standard Model
D = Dual Compressor Application (Single and Interconnected)	3 = Fourth Generation - Basic Standard Model
E = High Efficiency	4 = Basic Standard Model - Improved Sound
M = Alternate Pressure Relief Valve	5 = Inertia Series - Standard Model
N = No Pressure Relief Valve (Except G Series)	6 = Inertia Series - High Efficiency Model
O = Basic Standard Model	7 = Inertia Series - Second Generation High Efficiency Model
P = Basic Standard Model - Upgrade Plus	8 = Fifth Generation - Basic Standard Model Upgrade
1 = Second Generation - Basic Standard Model	9 = Sixth Generation - Basic Standard Model Upgrade

Type of Refrigerant.....

1 = R12*	5 = R502 or Alternate Replacement Refrigerant R402B	7 = R407C*
2 = R22		8 = R410A
3 = R134a	6 = R404A	9 = R407C, R22 (High Temp), R404A (Medium Temp)*

**Compressors in this series may be applied with additional refrigerants. Please contact your Bristol Compressors account representative for details.*

Refrigeration Application.....

H = High Temperature	R = Designed for Use with Multiple Refrigerants
L = Low Temperature	T = High Temperature (2 Capacities/2 or 4 Cylinders) - Twin/Single
M = Medium Temperature	V = Variable Speed

WARNING: The air conditioning unit is a pressurized system and hazards exist which could result in personal injury. It is therefore required that the following steps for trouble-shooting removal and installation of the hermetic compressor be performed by qualified personnel only.

BEFORE CONDEMNING A COMPRESSOR THAT FAILS TO START

1. **Verify all the following components are OK:**
   - A. Contactor
   - B. Winding resistance within manufacturer's specification (assure compressor is cool to the touch)
   - C. Compressor not grounded via ohmmeter/Megger, etc.
   - D. Compressor power terminals are tight and secure
   - E. Check for hot spots in system wiring (wire insulation melted, connectors/insulators melted, etc.)

2. **Verify lock rotor pull-down voltage (LRPDV):**
   Always check LRPDV before removing the old or new replacement compressor. If the LRPDV reduces the supply voltage to the compressor below the "guaranteed to start" voltage of the compressor (three-phase 230/208 LRPDV is 187V), the power supply must be corrected before removing the compressor. Always check all three legs, T1 to T2, T1 to T3, and T2 to T3. To perform this test on two-speed compressors, you should wire for single-speed operation as illustrated on page 19.

   Procedure to check for LRPDV: **(Warning: Make sure unit is properly grounded before proceeding!)**
   - A. Connect a voltmeter to the T1 terminal and T2 terminal of the compressor.
   - B. **Make sure the terminal cover and retainer is in place** (see warning page 7) then apply power to the compressor. If motor protector trips, allow time for reset before continuing.
   - C. If the voltage at the compressor terminals does not pull down below the **LRPDV** and the compressor still does not start, it is electrically or mechanically faulty.
   - D. Repeat A through C for voltage at T1-T3 and T2-T3.

INSTALLATION PROCEDURES AFTER COMPRESSOR HAS BEEN VERIFIED AS FAULTY:

WARNING: Never use oxygen to pressurize a refrigeration or air conditioning system. Oxygen can explode on contact with oil and could cause personal injury. When using high pressure gas such as nitrogen or CO_2 for this purpose, be sure to use a regulator that can control the pressure down to 1 psig.

The following instructions are general but include major points of consideration that will ensure proper installation and protect you from possible personal injury. Please use this as a checklist, taking each item in its order before proceeding to the next. If more information is required, please call Bristol Compressors Service Department.

☐ **1. VERIFY PROPER APPLICATION.** Verify that the compressor being replaced and the Bristol compressor have a like capacity for the refrigerant being used and that the **voltage** and **frequency** characteristics are the same. Consult your wholesaler if you have any questions about proper compressor application.

WARNING: To avoid electrical shock, power to the compressor should remain off during performance of steps 2 thru 14.

☐ **2. DETERMINE CAUSE OF INITIAL FAILURE.** In order to prevent a second failure, the cause of the original failure must be determined. Identify the cause and make the necessary repairs.

A. **BEFORE REMOVING THE FAULTY COMPRESSOR:** Remove refrigerant charge using proper recovery/reclaim procedures. Call 1-800-235-7882 for the name of the nearest Dupont authorized distributor, or 1-800-631-8138 for Honeywell Chemical Representative or 1-800-275-5532 for Mexichem Representative for information on refrigerant reclaim program.

B. Remove the electrical leads from the compressor. Note the terminal to which each wire is connected.

C. During the next operation, the access ports should be open so that pressure does not build up in the system. Use a high temperature torch to sweat the suction line and the discharge line loose from the compressor.

D. Assure excessive oil does not remain in the system, measure oil in the failed compressor and, if oil is low, flush excess from system (or see step 15 as an alternative). Good indicators of excess oil are: violent **vibration** and/or high **variable** sound as the extra oil moves through the system.

> **CAUTION:** The compressor may contain harmful acids ¾ be sure to handle with extreme care using proper protection equipment. After confirming oil charge level, return oil to the compressor and install suction and discharge rotalock caps. Copper tube fittings should be brazed closed. This is needed to prevent further contamination of the compressor and to prevent spillage from the compressor.

☐ **3. MOUNT THE NEW COMPRESSOR.** Do not remove dust cover or rubber shipping plugs until all other connections have been completed (i.e., filters installed and all tubing changes made per Steps 3, 4, 5 and 6). Compressor should not be open to the atmosphere for more than 15 minutes. Be sure to use the new mounting grommets that were shipped with the compressor. If the mounting sleeves shipped with the compressor are used, the mounting bolts will bottom out when tight. Use care not to over-compress the mounting grommets when the mounting sleeves cannot be used.

☐ **4. INSTALL FILTER DRIERS.** Bristol Compressors recommends the use of adequately sized liquid and suction line driers anytime a compressor is replaced. If the new compressor is used to replace a compressor with a burned motor, the use of high acid neutralizing filter drier is recommended. **For heat pumps, a suction filter drier must be installed between the accumulator and the compressor suction inlet. In addition, a bi-directional heat pump liquid line drier or factory recommended driers must be installed. NOTE: ALWAYS REMOVE OLD FILTER DRIERS.**

☐ **5. ATTACH SUCTION AND DISCHARGE LINES (FOR UNITS WITH ROTALOCKS).**

> **WARNING:** Do not remove the rotalock caps without first relieving the dry air charge in the compressor by carefully loosening the 1/4” flare suction access port cap to allow slow release of all pressure.

After all housing pressure is relieved, remove the rotalock caps from the suction and discharge line fittings on the compressor. On rotalock fittings, be sure the Teflon fiber seal located on the face of the fittings are seated properly and are not damaged. Attach the suction and discharge line to the compressor as follows:

A. Align the suction and discharge line with the fitting on the compressor to ensure a good seal when the lines are tightened. In some cases, it may be necessary to modify the system tubing to ensure proper alignment.

B. Tighten the nuts on the suction and discharge line until you detect metal-to-metal contact between the fittings. At this point, the Teflon fiber seal has been totally compressed. Tighten the nuts an additional 1/4 turn to ensure good contact and a proper seal. (See rotalock torque valves on page 21.)

> **CAUTION:** A Teflon seal is factory installed on the face of the suction and discharge line rotalock fitting of the compressor. Use care not to damage this seal while removing the shipping plug or attaching the suction line. Also, be sure to check the shipping plug once it has been removed to ensure that part of the plug did not remain in the compressor.

☐ **6. BRAZE ON SUCTION AND DISCHARGE LINES.** Carefully remove the rubber plugs from the suction and discharge line fittings. Flow an inert gas, such as nitrogen or CO_2, through the system at approximately 1/4 to 1 psig to reduce the possibility of oxidation inside the tubing. Braze on the suction and discharge lines following the recommendation listed below (if a process tube is provided, it should be brazed shut after the system has been charged):

COPPER TUBING: If additional copper tubing is required, use only clean, dehydrated refrigeration grade tubing with sealed ends.

BRAZING ALLOYS: **CAUTION: Do not use 95/5, 50/50 or 40/60 soft solder for brazing.** Use Sil-Fos or Phos Copper, or similar brazing alloys with high tensile strength on copper welds only. Weld steel to copper only with silver brazing alloys.

BRAZING PROCEDURE: To ensure properly brazed joints, Bristol Compressors recommends that the following steps be used:

a. Exercise extreme care when cutting and forming tubes to keep dirt, filings, and other contaminants from entering the system.
b. Do not use excessive amounts of brazing alloy as some of the excess may penetrate the joint and enter the system.
c. If flux must be used, take necessary precautions to ensure that the flux does not enter the system.
d. Use damp cloths or other heat absorbent material to ensure that the factory brazed joints on the compressor do not become damaged. If damp cloths are used, take care not to allow moisture to enter the system.
e. Do not overheat brazed joints as excess heat will cause formation of copper oxide on the inside wall of the tubing. Flow an inert gas through the system, as explained above.

☐ **7.** If the Bristol compressor is being used as a replacement for a semi-hermetic using an oil pressure switch, remove the switch from the unit. The Bristol compressor requires no such switch.

☐ **8.** **CHECK SYSTEM FOR LEAKS.** After installation is complete, pressurize the system to 75 psig using nitrogen and a few ounces of system refrigerant. Check for leaks using a halide torch, soap bubbles or an electronic halogen leak detector. When all connections test satisfactorily, release pressure using proper recovery procedures, then proceed to next step.

> **CAUTION:** Do not use the Bristol replacement compressor as an evacuation assist and never apply voltage to a compressor while it is in a vacuum as damage could result to the compressor.

☐ **9.** **EVACUATE THE SYSTEM.** Use a vacuum pump designed for this purpose. Vacuum must be pulled on the discharge (high side) and suction (low side) of the system. Evacuate to 200 microns or lower.

☐ **10.** **CHARGE THE SYSTEM**. When a vacuum of at least 200 microns is reached, close gauge valve, remove vacuum pump, and break the vacuum using system refrigerant vapor. Never dump liquid refrigerant into the compressor. Liquid can be used to break the vacuum if it is connected to the liquid line, not the discharge line.

Charge the system according to the manufacturer's specifications. Be sure to compensate the charge for the addition of the filter drier. The preferred superheat should be 18-20°F (10-11°C) at the compressor on a system with a TXV, see Step 16.

WEIGHING in the system charge to the factory specification will help point out system faults that may still exist.

☐ **11.** **INSTRUCTIONS FOR CHANGING MOTOR PROTECTION MODULES IN BRISTOL "G" SERIES COMPRESSORS: (Refer to page 10 for module summary chart)**

WARNING: Assure power is turned off; sensor terminals can be hot to ground!

A. Compressors identified with a "P" or "R" in the ninth character of the model number and small (12") diameter housing
   1. Disconnect the two wires from the two-pin hermetic terminal in the compressor housing.
   2. Remove the module mounting screws and remove the module and connecting wires.
   3. Install the new module using the same mounting screws. Two sensor lead wires should be attached

to the designated module terminals per the appropriate wiring diagram in this booklet. The free ends should be fitted onto the two hermetic terminals. Either wire on either terminal is OK.

4. Follow appropriate wiring diagram in this booklet for connections to unit power and control circuit.

B. Compressors identified with a "P" or "R" in the ninth character of the model number and large (14") diameter housing

1. Before disconnecting the four sensor leads, please note the top left pin of the four-pin terminal is in the "COMMON" pin.
2. Disconnect the four-wire block connector from the four-pin hermetic terminal in the compressor housing.
3. Remove the module mounting screws and remove the module and connecting wires.
4. Install the new module using the same mounting screws. Make the sensor lead wire connections as follows, depending on the particular module being installed: (a) If the module includes one black wire and three orange wires, connect the black wire to the common terminal as determined in Step 1 above. Connect the other three orange wires to the three remaining pins in any order.
5. Follow appropriate wiring diagram in this booklet for connections to unit power and control circuit.

☐ **12.** All electrical components should be checked. If faulty, or signs of degradation are found, they should be replaced. Check all connections and terminals for tightness. **Use only a new Bristol protection module when using Bristol replacement compressors.**

WARNING: Voltage should not be applied to the compressor with the terminal cover and retainer(s) removed as personal injury could result.

☐ **13.** Check pages 11 thru 16, 18 and 19 for correct wiring diagram.

WARNING: Do not remove "C" sensor wire on AE or 31AA modules or "S1" sensor wire on AE or 30AA modules. These terminals are internally connected to line voltage, can be "hot" to ground.

WARNING: Cannot use ICM parallel motor protection modules, part numbers 241730 or 241731, with Kriwan sensors (cold resistance of 30-100 ohms for parallel sensors) because the modules have "shorted sensor protection" that does not allow operation below 500 ohms.

VERY IMPORTANT: Before applying power to the compressor, be sure to perform a functional check of the motor protection system. This can be done by wiring the provided module as shown with the appropriate schematic, leaving the power supply wires from the main contactor open ¾ NO POWER TO COMPRESSOR. Then apply control circuit power. Main contactor should pull-in (or energize), assuming all other safeties are closed. Next, carefully remove module sensor wires from compressor (only one necessary unless block connector is used). TAKE CARE NOT TO SHORT LEAD AGAINST HOUSING. The main contactor should immediately open. If this does not happen, thoroughly check control wiring unit until this functional check is positive. Then complete the system wiring.

WARNING: Replacement compressor failure may result if you fail to check the total electrical system against the equipment manufacturer's service manual and the Bristol compressor wiring diagram before start-up. Make sure the electrical characteristics of the Bristol replacement compressor are the same as the original compressor.

☐ **14.** Bristol recommends a four-minute time delay on break in series with the contactor to prevent short cycling of the compressor from possible defective or improper operation of controls.

☐ **15.** **Confirm oil is in compressor sight glass by depressing Schrader.** After approximately two hours running time, depress Schrader again and check the sight glass to be sure there is adequate oil in the compressor. If oil

level is not visible, add Shrieve Zerol 150T oil until the level reaches the approximate mid-point of sight glass. If oil level is above sight glass, remove oil until level is approximately 1/8” below top of sight glass.

☐ **16. WORST CASE CONDITION CHECKS.**

HEAT PUMP

STEP 1: Operate system in the heating mode with outdoor fan disconnected.

STEP 2: Run system until the designed winter condition in your area is reached (may need to cover coil for this test).

STEP 3: Check suction superheat 6" from compressor inlet.

STEP 4: Superheat should not drop below 5°F (3°K) (prefer no lower than 10°F [6°K]).

STEP 5: Sump temperature should always be 50°F (28°C) or higher above saturated suction temperature.

EXAMPLE: "R-22"

38 psig = 16°F (-9°C)	= SATURATED SUCTION
+ 50°F (28°K)	= MINIMUM TEMP. DIFFERENCE
66°F (19°C)	= MINIMUM SUMP TEMPERATURE

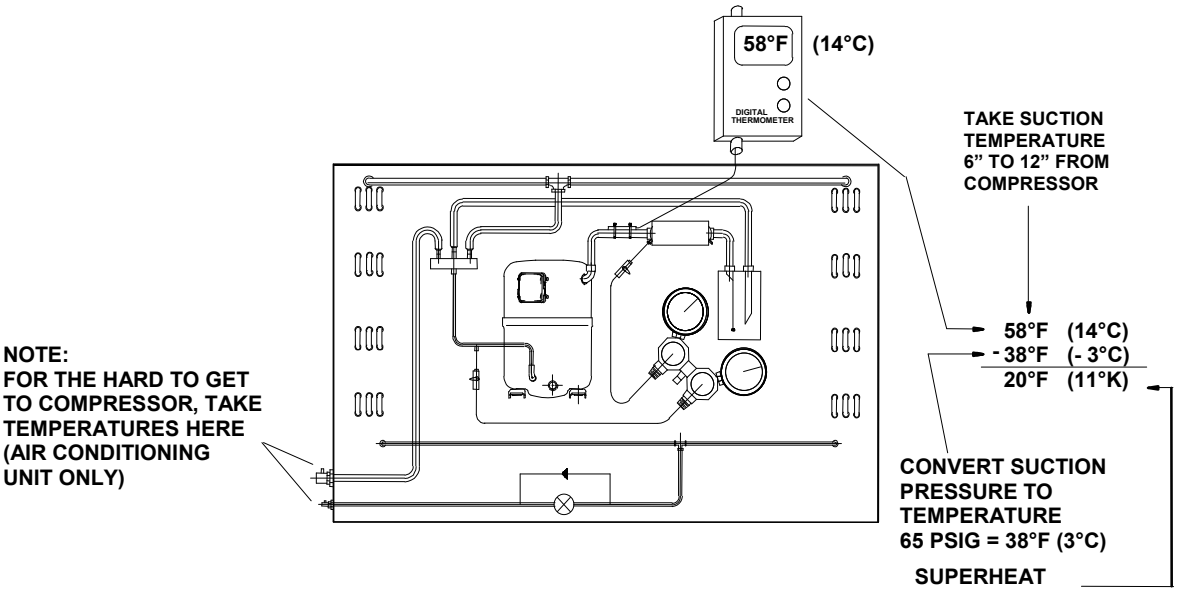
COOLING MODE (HEAT PUMP):

STEP 1: Operate system in cooling mode with indoor fan disconnected and repeat steps 3, 4 and 5.

AIR-CONDITIONING ONLY UNITS

STEP 1: Operate system in the cooling mode with indoor fan disconnected and repeat steps 3, 4 and 5.

HOW TO CHECK RETURN GAS SUPERHEAT



☐ **17. CHECK FILTER DRIER FOR CONTAMINATION.**

A. **Suction Line Filter:** If internal contamination is heavy, the suction line filter drier may become clogged and ineffective. Check the pressure drop across the filter drier after approximately 8 hours running time and, if it exceeds 2 psig, replace.

B. **Liquid Line Filter:** Always replace the original equipment liquid line filter drier(s). If the OEM liquid line drier(s) is not removed from the system, a restriction most likely will result. Just a slight restriction in this filter will reduce the efficiency of the system. A large restriction will cause the suction pressure and discharge pressure to be reduced. This reduction in pressure will occur only with a properly charged system (i.e., refrigerant weighed in to the OEM specifications). An overcharged system will increase pressures when there is a restriction in the liquid line. The service person tends to add more charge to the system to increase the suction pressure. Normally any charge added above the OEM specifications will increase the suction pressure due to the discharge pressure increasing, but in the case of a restriction, charge can be added to a point the system shuts down on the high pressure switch. The service person may not see the higher discharge pressure if the service port is in the liquid line which is normally downstream from the liquid line filter drier in split systems. A pressure port installed in the hot gas discharge line, just as it exits the compressor, is required to see true discharge pressure.

IMPORTANT: The compressor has an internal relief valve (IPRV) that is designed to open if the system is subjected to a high pressure situation. Example causes are: overcharged, air in system, restriction, factory installed metering device screens not removed and cleaned, old liquid line filter left in the system, poor airflow across the condenser, condenser fan failure, poor airflow across the evaporator in the heating mode (dirty return air filter(s)), poor system design (duct system undersized), etc. The IPRV will open when the discharge pressure exceeds the suction pressure by more than 450 psi (smaller than 15-ton products) or 400 psi (larger than 15-ton products). If the relief valve opens, a high velocity gas flow may be heard inside the compressor housing. In some cases, the relief may open so quickly due to a restriction in the system, the high pressure will be difficult to observe on standard gauges. In most instances, if the service person installs a discharge service gauge on the discharge line just as it exits the compressor, the development of high pressure can be observed before the relief valve opens. Installing the discharge service gauge on the liquid line outside the system may not detect a restriction. To reset the relief valve, shut the compressor off for a couple of minutes, allowing pressures to equalize.

☐ **REVIEW ALL SEVENTEEN STEPS TO MAKE SURE NOTHING WAS OVERLOOKED.**

Summary of Electronic Modules

Bristol PN	Replace with Bristol PN	Vendor P/N	Supply Voltage	Output	Sensors*	Rtrip (W)	Reset	Delay After Break	LVCO	Short Sensor	248XXX Schematic Decals	Screw	Connector Wires
241073	None	10AA307	24	Voltage	Series	25K-35K	Auto	No	No	Yes	*obsolete*	201125	*obsolete*
241283	None	10AA309	24	Voltage	Series	25K-35K	Manual	Yes (lock out)	No	Yes	*obsolete*	201125	*obsolete*
241317	None	15AA1500A	24	Control	Parallel	10K-18K	Manual	Yes (lock out)	No	Yes	*obsolete*	201126	241353
241359	241731 or 241744	15AA1000A	24	Control	Parallel	10K-18K	Auto	No	No	Yes	*obsolete*	201126	241353
241373	241732 or 241742	15AA1106A	24	Control	Series	26K-34K	Auto	Yes	No	Yes	*obsolete*	201126	651043
241374	241733 or 241743	15AA1607B	120	Control	Series	26K-34K	Auto	Yes	Yes	Yes	*obsolete*	201126	651043
241375	241734 or 241743	15AA1607C	208/230	Control	Series	26K-34K	Auto	Yes	Yes	Yes	*obsolete*	201126	651043
241376	241732 or 241742	MP50-9401	24	Control	Series	26K-34K	Auto	Yes	No	Yes	*obsolete*	201126	651043
241377	241733 or 241743	MP50-8601	120	Control	Series	26K-34K	Auto	Yes	Yes	Yes	*obsolete*	201126	651043
241378	241734 or 241743	MP50-8801	208/230	Control	Series	26K-34K	Auto	Yes	Yes	Yes	*obsolete*	201126	651043
241379	241731 or 241744	15AA1105A	24	Control	Parallel	10K-16K	Auto	Yes	No	Yes	*obsolete*	201126	241353
241380	241745	15AA1606B	120	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	*obsolete*	201126	241353
241381	241745	15AA1606C	208/230	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	*obsolete*	201126	241353
241382	241731 or 241744	MP50-9201	24	Control	Parallel	10K-16K	Auto	Yes	No	Yes	*obsolete*	201126	241353
241383	241745	MP50-8001	120	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	*obsolete*	201126	241353
241384	241745	MP50-8201	208/230	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	*obsolete*	201126	241353
241559	241743	15AA1706C	208/230	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	*obsolete*	201126	241353
241560	241734 or 241743	15AA1707C	208/230	Control	Series	26K-34K	Auto	Yes	Yes	Yes	*obsolete*	201126	651043
241679	241731	31AA1105A	24	Control	Parallel	10K-16K	Auto	Yes	Yes	No	053,508,509, 510	201126	241353
241680	241745	31AA1606E	120&208/ 230	Control	Parallel	10K-16K	Auto	Yes	Yes	No	051,052	201126	241353
241696	241732	30AA200A	24	Control	Series	26K-34K	Auto	Yes	Yes	No	053,508,509, 510	201126	651043
241697	241733 or 241743	30AA300B	120	Control	Series	26K-34K	Auto	Yes	Yes	No	051,052	201126	651043
241698	241734 or 241743	30AA300C	208/230	Control	Series	26K-34K	Auto	Yes	Yes	No	051,052	201126	651043
241730	241745	AE7114	120&208/ 230	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	*obsolete*	201126	241353
241731	241770	AE7113	24	Control	Parallel	10K-16K	Auto	Yes	Yes	Yes	053,508,509, 510	201126	241353
241732	241772	AE7110	24	Control	Series	26K-34K	Auto	Yes	Yes	No	051,052	201126	651043
241733	241774	AE7111	120	Control	Series	26K-34K	Auto	Yes	Yes	No	051,052	201126	651043
241734	241774	AE7112	208/230	Control	Series	26K-34K	Auto	Yes	Yes	No	051,052	201126	651043
241744	241770	41AA1105A	24	Control	Parallel	10K-16K	Auto	Yes	Yes	No	*obsolete*	201126	241353
241745	241771	41AA1606E	120&208/ 240	Control	Parallel	10K-16K	Auto	Yes	Yes	No	511,512,513, 514	201126	241353
241770		INT 369 R	24	Control	Parallel	10K-16K	Auto	Yes	Yes	No	511,512,513	201126	241353
241771		INT 369 R	120 & 240	Control	Parallel	10K-16K	Auto	Yes	Yes	No	511,512,513	201126	241353
241772		INT 169 R	24	Control	Series	26K-34K	Auto	Yes	Yes	No	052	201126	651043
241774		INT 169 R	120 & 240	Control	Series	26K-34K	Auto	Yes	Yes	No	052	201126	651043

*Series – 7 1/2, 8 1/2, 10 ton
Parallel – 15, 17, 20, 24 ton

"G" COMPRESSOR WIRING DIAGRAM (DUAL POWER TERMINAL MODELS) (WITH AE, 31AA, 41AA OR 369R MODULE) - PARALLEL MODULE (4 SENSOR PINS)

MODELS:
H**G204FR
H**G244FR
H**G294FR
(Part Winding Start)

H**G204DP
(Full Winding Start)

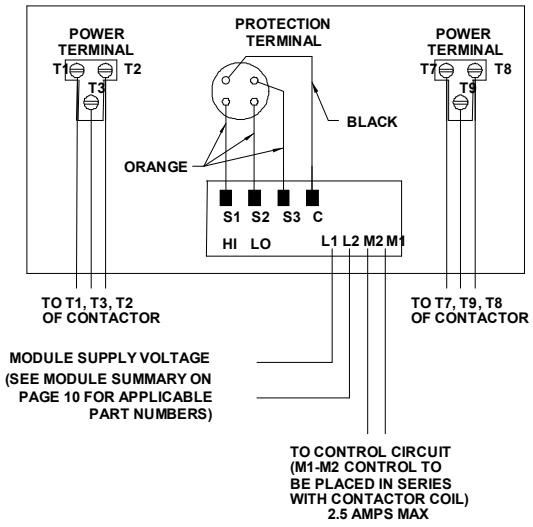
Voltages:
230/208 3-PH

POWER CIRCUIT
(Full and Part-Winding Start Models)

CAUTION: AE and 31AA module common ("C") sensor terminal internally connected to line voltage, can be "hot" to ground.

WARNING: Compressor terminals must be wired in phase for proper operation.

PHASE 1 - T1 & T7
PHASE 2 - T2 & T8
PHASE 3 - T3 & T9



CAUTION:
ICM modules (part numbers 241730 and 241731) cannot be used with Kriwan sensors (30-100 ohms, cold).

HI-LO CONNECTIONS APPLY ONLY TO AE OR 31AA

MODULE SUPPLY VOLTAGE
24V - No additional wiring
120V - Jumper terminal LO to L2 terminal
230V - Jumper terminal HI to L2 terminal

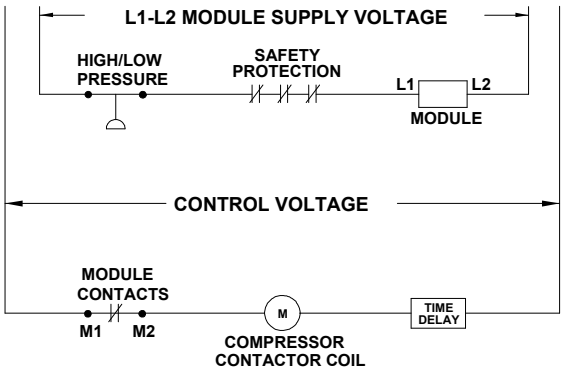
MOTOR PROTECTION SYSTEM

Modules have a 4 minute delay upon interruption of L1-L2 supply or after any fault condition occurs.

To prevent short cycling of compressor, wire high/low pressure switch and other safety switches in series with L1 or L2 power terminal on module.

WARNING: Turn power off before checking sensors. Allow unit to cool for 1-hour minimum. Disconnect module from terminals. Check sensors resistance using ohmmeter with 6-volt maximum supply. Cold resistance range: From common pin (top left) to each of the other three pins.
Supplier #1: 30-100 ohms
Supplier #2: 500-2500 ohms

See caution below!



IMPORTANT: Bristol recommends a 4-minute delay on break anti-short cycling time delay to prevent contactor chattering.

Control voltage (thru M1-M2 on module) can be different from module supply voltage (L1-L2). Voltage to L1-L2 must be as marked on module.

"HI" and "LO" connections apply only on 120V and 208/240V modules.

Crankcase heater must be connected to continuous power source.

"G" COMPRESSOR WIRING DIAGRAM (DUAL POWER TERMINAL MODELS) (WITH AE, 31AA, 41AA OR 369R MODULE) - PARALLEL MODULE (4 SENSOR PINS)

MODELS:
H**G204LP
H**G244LP
H**G294LP

Voltages:
230/208 3-PH
460 3-PH

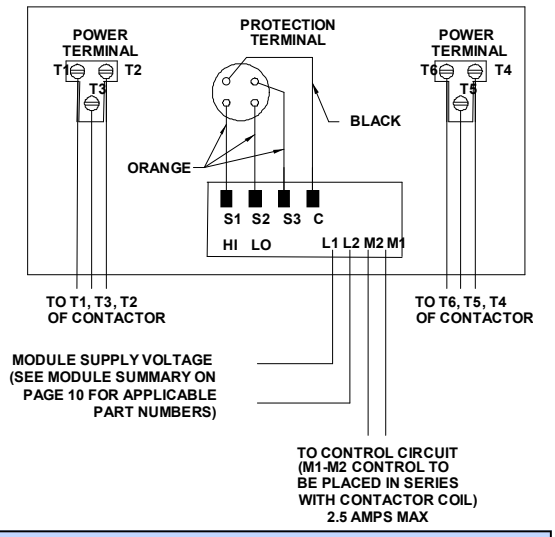
POWER CIRCUIT
(Wye-Delta Models)

CAUTION: AE and 31AA module common ("C") sensor terminal internally connected to line voltage, can be "hot" to ground.

WARNING: Compressor terminals must be wired in phase for proper operation.

PHASE 1 - T1 & T6
PHASE 2 - T2 & T4
PHASE 3 - T3 & T5

Wye-Delta Connection:
Run (Delta) - 1 & 6, 2 & 4, 3 & 5
Start (Wye) - 1, 2, 3, (4, 5, 6 together)



CAUTION:
ICM modules (part numbers 241730 and 241731) cannot be used with Kriwan sensors (30-100 ohms, cold).

HI-LO CONNECTIONS APPLY ONLY TO AE OR 31AA

MODULE SUPPLY VOLTAGE
24V - No additional wiring
120V - Jumper terminal LO to L2 terminal
230V - Jumper terminal HI to L2 terminal

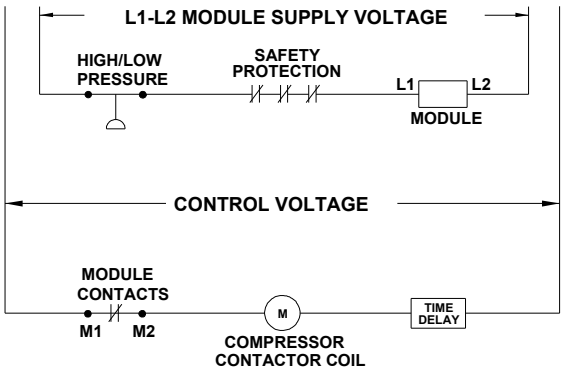
MOTOR PROTECTION SYSTEM

Modules have a 4 minute delay upon interruption of L1-L2 supply or after any fault condition occurs.

To prevent short cycling of compressor, wire high/low pressure switch and other safety switches in series with L1 or L2 power terminal on module.

WARNING: Turn power off before checking sensors. Allow unit to cool for 1-hour minimum. Disconnect module from terminals. Check sensors resistance using ohmmeter with 6-volt maximum supply. Cold resistance range: From common pin (top left) to each of the other three pins.
Supplier #1: 30-100 ohms
Supplier #2: 500-2500 ohms

See caution below!



IMPORTANT: Bristol recommends a 4-minute delay on break anti-short cycling time delay to prevent contactor chattering.

Control voltage (thru M1-M2 on module) can be different from module supply voltage (L1-L2). Voltage to L1-L2 must be as marked on module.

"HI" and "LO" connections apply only on 120V and 208/240V modules.

Crankcase heater must be connected to continuous power source.

"G" COMPRESSOR WIRING DIAGRAM (SINGLE POWER TERMINAL MODELS) (WITH AE, 31AA, 41AA OR 369R MODULE) - PARALLEL MODULE (4 SENSOR PINS)

MODELS:
H*2G184DP

Voltages:
230/208 3-PH

H**G184DP
H**G204DR
H**G244DR
H**G294DP

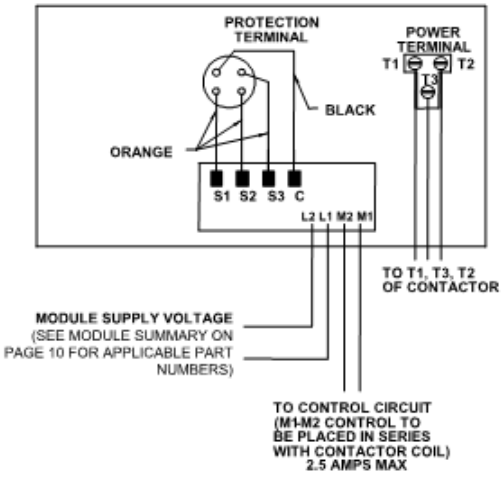
Voltages:
460 3-PH
575 3-PH

H**G204DR
H**G244DR

Voltages:
380 3-PH

POWER CIRCUIT

CAUTION: AE and 31AA module common ("C") sensor terminal internally connected to line voltage, can be "hot" to ground.



CAUTION:
ICM modules (part numbers 241730 and 241731) cannot be used with Kriwan sensors (30-100 ohms, cold).

HI-LO CONNECTIONS APPLY ONLY TO AE OR 31AA

MODULE SUPPLY VOLTAGE
24V - No additional wiring
120V - Jumper terminal LO to L2 terminal
230V - Jumper terminal HI to L2 terminal

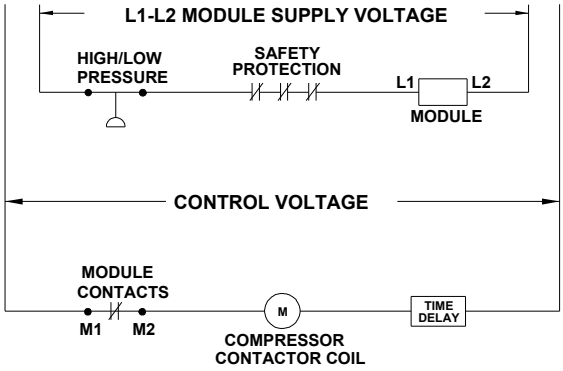
MOTOR PROTECTION SYSTEM

Modules have a 4 minute delay upon interruption of L1-L2 supply or after any fault condition occurs.

To prevent short cycling of compressor, wire high/low pressure switch and other safety switches in series with L1 or L2 power terminal on module.

WARNING: Turn power off before checking sensors. Allow unit to cool for 1-hour minimum. Disconnect module from terminals. Check sensors resistance using ohmmeter with 6-volt maximum supply. Cold resistance range: From common pin (top left) to each of the other three pins.
Supplier #1: 30-100 ohms
Supplier #2: 500-2500 ohms

See caution below!



IMPORTANT: Bristol recommends a 4-minute delay on break anti-short cycling time delay to prevent contactor chattering.

Control voltage (thru M1-M2 on module) can be different from module supply voltage (L1-L2). Voltage to L1-L2 must be as marked on module.

"HI" and "LO" connections apply only on 120V and 208/240V modules.

Crankcase heater must be connected to continuous power source.

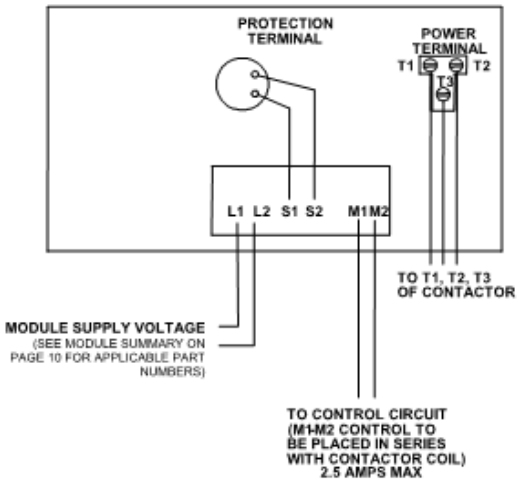
"G" COMPRESSOR WIRING DIAGRAM (SINGLE POWER TERMINAL MODELS) (WITH AE, 30AA, 40AA OR 169R MODULE) - SERIES MODULE (2 SENSOR PINS)

MODELS:
H**G094DP
H**G104DR
H**G124DP

Voltages:
230/208 3-PH
460 3-PH
575 3-PH

POWER CIRCUIT

CAUTION: AE and 30AA module ("S1") sensor terminals are internally connected to line voltage, can be "hot" to ground.

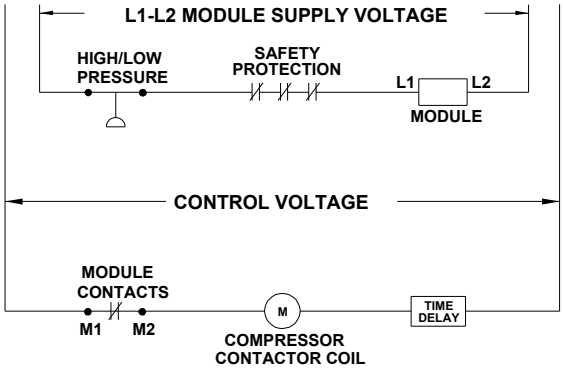

PROTECTION TERMINAL
POWER TERMINAL
T1
T2
T3
L1 L2 S1 S2
M1M2
TO T1, T2, T3 OF CONTACTOR
MODULE SUPPLY VOLTAGE
(SEE MODULE SUMMARY ON PAGE 10 FOR APPLICABLE PART NUMBERS)
TO CONTROL CIRCUIT (M1-M2 CONTROL TO BE PLACED IN SERIES WITH CONTACTOR COIL) 2.5 AMPS MAX

MOTOR PROTECTION SYSTEM

Modules have a 4 minute delay upon interruption of L1-L2 supply or after any fault condition occurs.

To prevent short cycling of compressor, wire high/low pressure switch and other safety switches in series with L1 or L2 power terminal on module.

WARNING: Turn power off before checking sensors. Allow unit to cool for 1-hour minimum. Disconnect module from terminals. Check sensors resistance using ohmmeter with 6-volt maximum supply. Cold resistance range: From common pin (top left) to each of the other three pins.
Supplier #1: 90-300 ohms
Supplier #2: 1500-7500 ohms



IMPORTANT: Bristol recommends a 4-minute delay on break anti-short cycling time delay to prevent contactor chattering.

Control voltage (thru M1-M2 on module) can be different from module supply voltage (L1-L2). Voltage to L1-L2 must be as marked on module.

Crankcase heater must be connected to continuous power source.

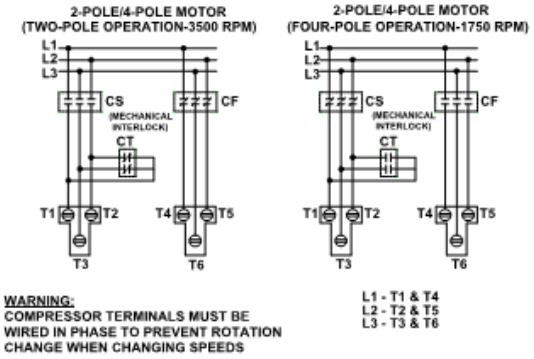
"G" COMPRESSOR WIRING DIAGRAM (TWO SPEED MODELS)
(WITH AE, 31AA, 41AA OR 369R MODULE) - PARALLEL MODULE (4 SENSOR PINS)

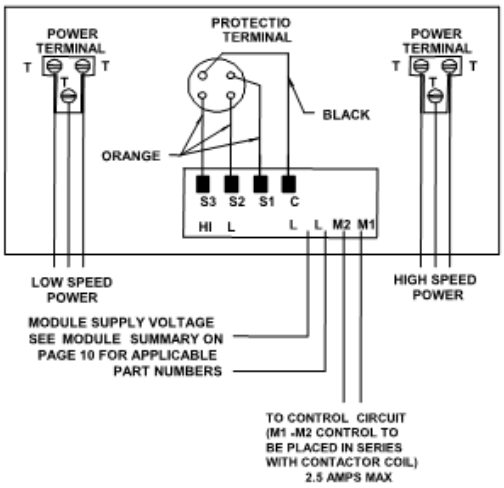
MODELS:
H**G144GP
H**G184GP
H**G204GP
H**G244GP

Voltages:
230/208 3-PH
460 3-PH
575 3-PH

POWER CIRCUIT

CAUTION: AE and 31AA module common ("C") sensor terminal internally connected to line voltage, can be "hot" to ground.





CAUTION:
ICM modules (part numbers 241730 and 241731) cannot be used with Kriwan sensors (30-100 ohms, cold).

HI-LO CONNECTIONS APPLY ONLY TO AE OR 31AA

MODULE SUPPLY VOLTAGE
24V - No additional wiring
120V - Jumper terminal LO to L2 terminal
230V - Jumper terminal HI to L2 terminal

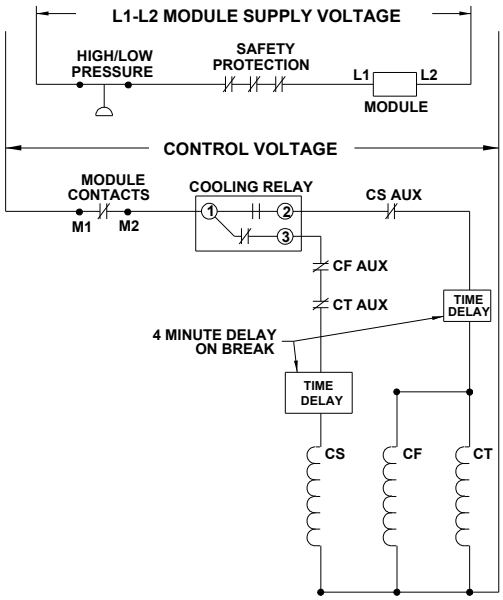
MOTOR PROTECTION SYSTEM

Modules have a 4 minute delay upon interruption of L1-L2 supply or after any fault condition occurs.

To prevent short cycling of compressor, wire high/low pressure switch and other safety switches in series with L1 or L2 power terminal on module.

WARNING: Turn power off before checking sensors. Allow unit to cool for 1-hour minimum. Disconnect module from terminals. Check sensors resistance using ohmmeter with 6-volt maximum supply. Cold resistance range: From common pin (top left) to each of the other three pins.
Supplier #1: 30-100 ohms
Supplier #2: 500-2500 ohms

See caution below!



IMPORTANT: Bristol recommends a 4-minute delay on break anti-short cycling time delay to prevent contactor chattering.

Control voltage (thru M1-M2 on module) can be different from module supply voltage (L1-L2). Voltage to L1-L2 must be as marked on module.

"HI" and "LO" connections apply only on 120V and 208/240V modules.

Crankcase heater must be connected to continuous power source.

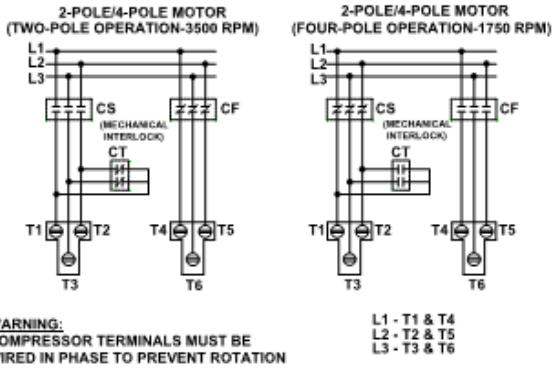
"G" COMPRESSOR WIRING DIAGRAM (TWO SPEED MODELS)
(WITH AE, 30AA, 40AA OR 169R MODULE) - SERIES MODULE (2 SENSOR PINS)

MODELS:
H**G094GP
H**G104GP
H**G124GP

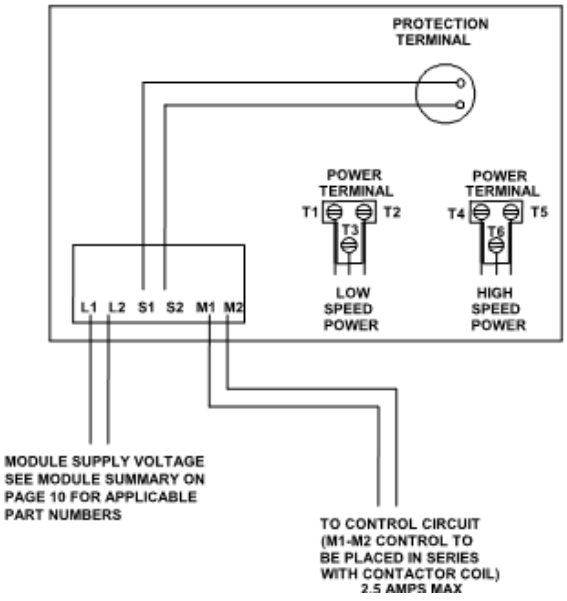
Voltages:
230/208 3-PH
460 3-PH
575 3-PH

POWER CIRCUIT

CAUTION: AE and 30AA module ("S1") sensor terminals are internally connected to line voltage, can be "hot" to ground.



WARNING:
COMPRESSOR TERMINALS MUST BE WIRED IN PHASE TO PREVENT ROTATION CHANGE WHEN CHANGING SPEEDS

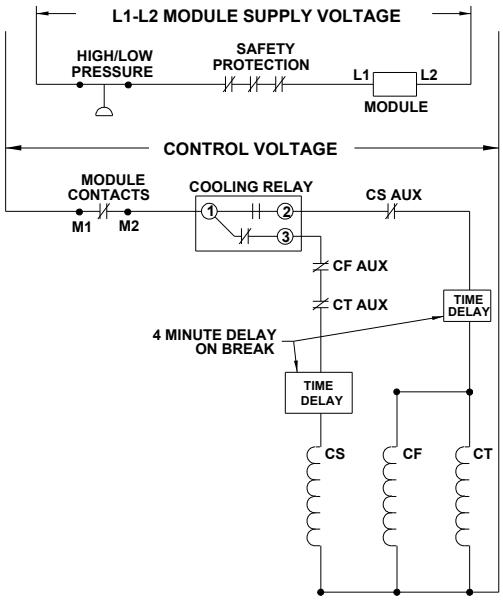


MOTOR PROTECTION SYSTEM

Modules have a 4 minute delay upon interruption of L1-L2 supply or after any fault condition occurs.

To prevent short cycling of compressor, wire high/low pressure switch and other safety switches in series with L1 or L2 power terminal on module.

WARNING: Turn power off before checking sensors. Allow unit to cool for 1-hour minimum. Disconnect module from terminals. Check sensors resistance using ohmmeter with 6-volt maximum supply. Cold resistance range: From common pin (top left) to each of the other three pins.
Supplier #1: 90-300 ohms
Supplier #2: 1500-7500 ohms



IMPORTANT: Bristol recommends a 4-minute delay on break anti-short cycling time delay to prevent contactor chattering.

Control voltage (thru M1-M2 on module) can be different from module supply voltage (L1-L2). Voltage to L1-L2 must be as marked on module.

"HI" and "LO" connections apply only on 120V and 208/240V modules.

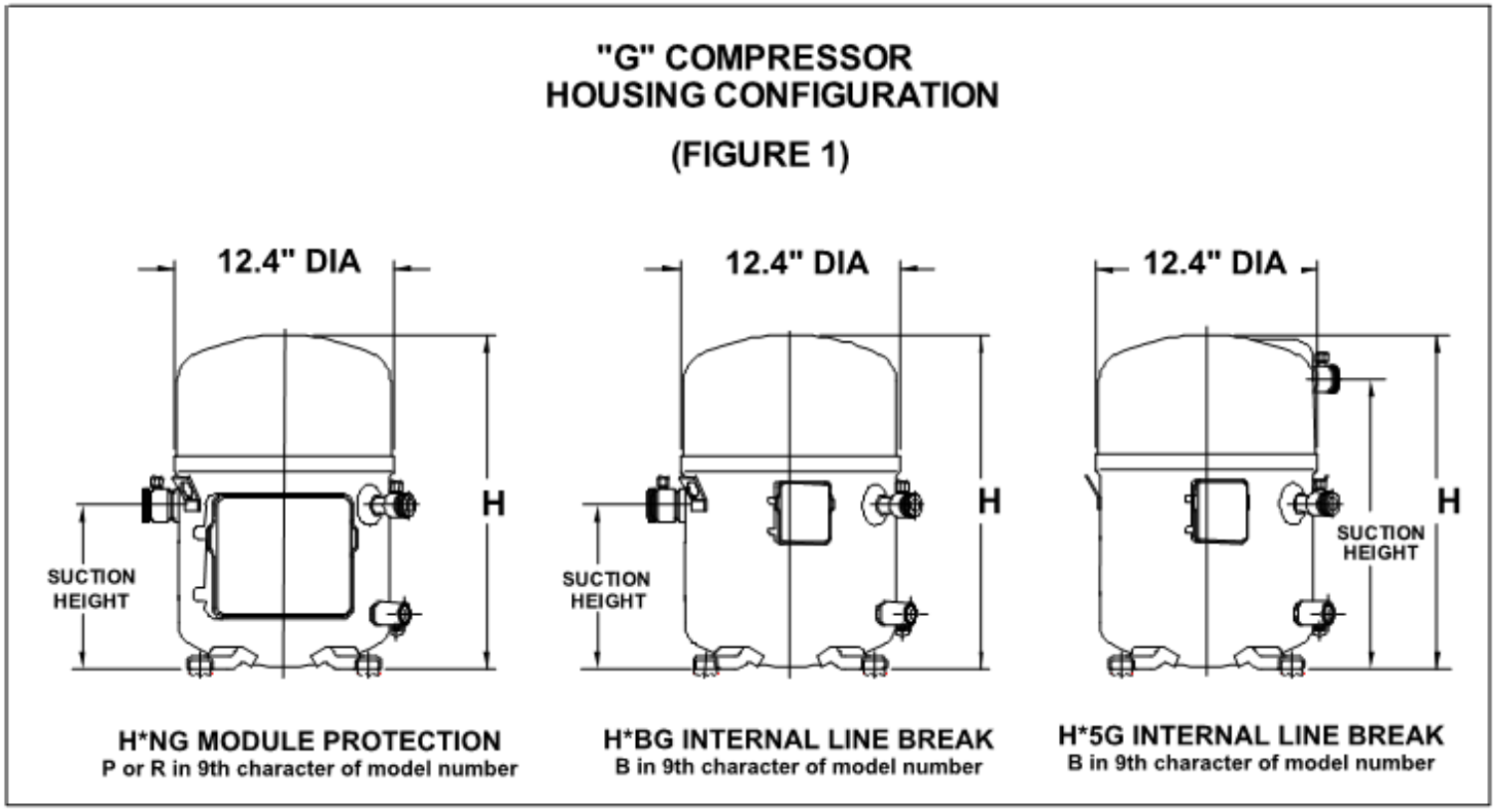
Crankcase heater must be connected to continuous power source.

“G” SERIES INTERNAL LINE BREAK

(COMPARED TO MODULE PROTECTED PRODUCTS)

Models	Housing Height in Inches			Suction Tube Height in Inches		
	H*NG	H*BG	H*5G	H*NG	H*BG	H*5G
094	17.1	17.6	18.4	9	9	16
104	17.9	18.4	19.6	9	9	17.2
124	17.9	18.4	20.4	9	9	18
144	—-	—-	20.6	—-	—-	18.2

NOTE: See page 25 for models equivalent to the listed vintage H*NG, H*BG and H*5G models.



NOTE:
Single speed compressors have internal line break protection and do not require a module. They are available in the 094, 104, 124 and 144 models. The line break models are physically identical to the vintage H*NG solid-state protector models except for a smaller terminal box and a slight increase in height as shown in Figure 1. The H*5G models are physically identical to the H*BG except for suction tube location and an increase in housing height.

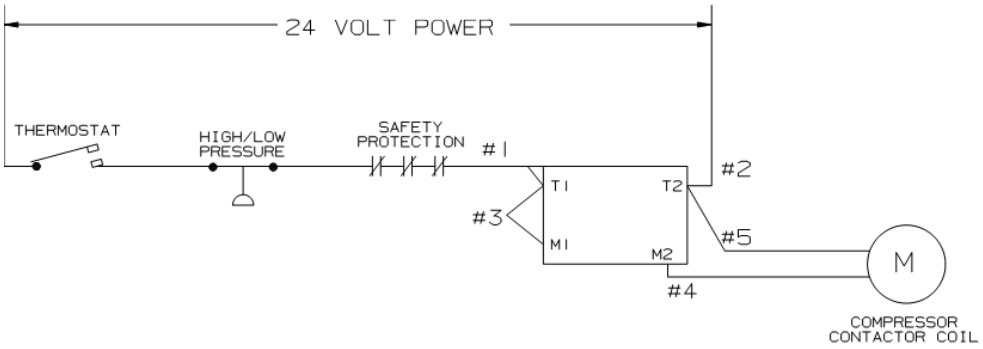
Replacement of module-protected single speed models with line break single speed models (when module is used as motor protection only and is not controlled by thermostat), requires only two simple steps:

1. Remove the wires originally run from the line or transformer to terminals L1 and L2 on the solid state module.
2. Connect the two wires together that were originally run to terminals M1 and M2 on the solid state module.

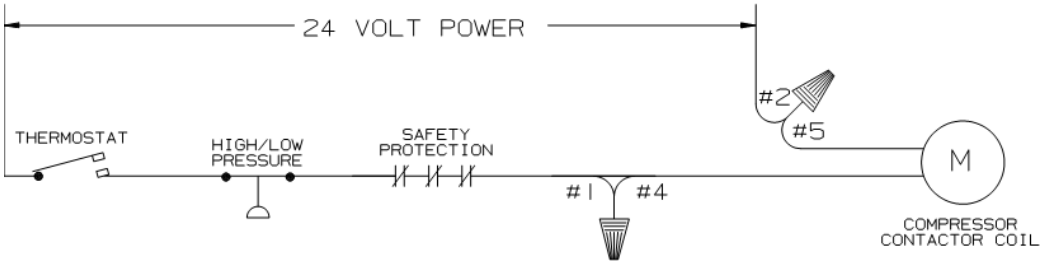
See next page if module is controlled with thermostat.

REPLACING MODULE PROTECTED COMPRESSORS WITH INTERNAL LINE BREAK PROTECTED COMPRESSORS WHERE THE SYSTEM THERMOSTAT IS USED TO CONTROL THE MODULE

MODULE PROTECTED COMPRESSORS

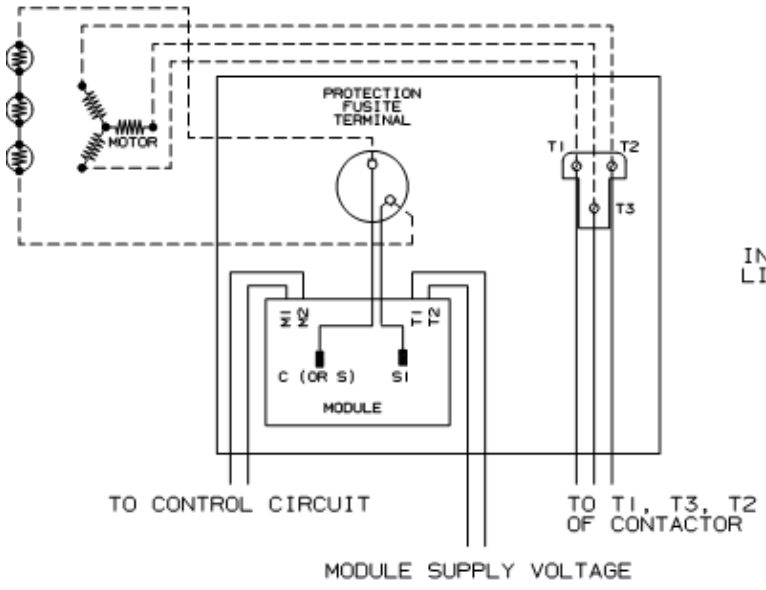


LINE BREAK PROTECTED COMPRESSORS

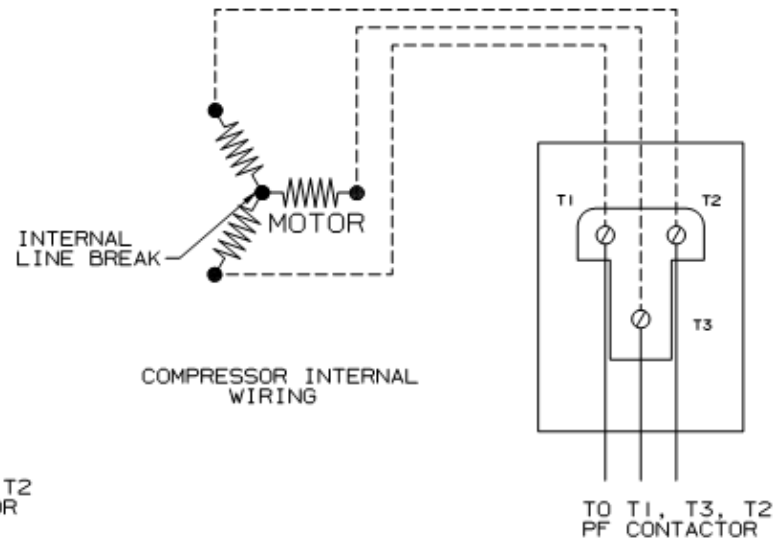


"G" COMPRESSOR - WIRING DIAGRAM
(Single Power Terminal Models with Series Sensor Module Protection)

MODULE PROTECTED

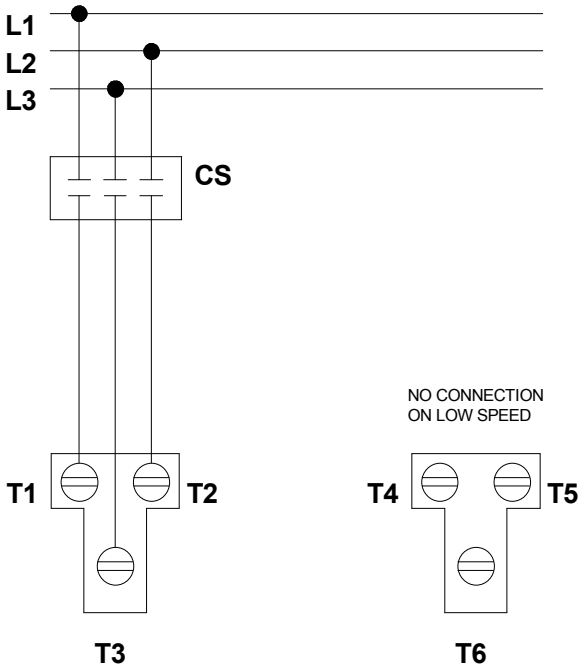


LINE BREAK PROTECTED

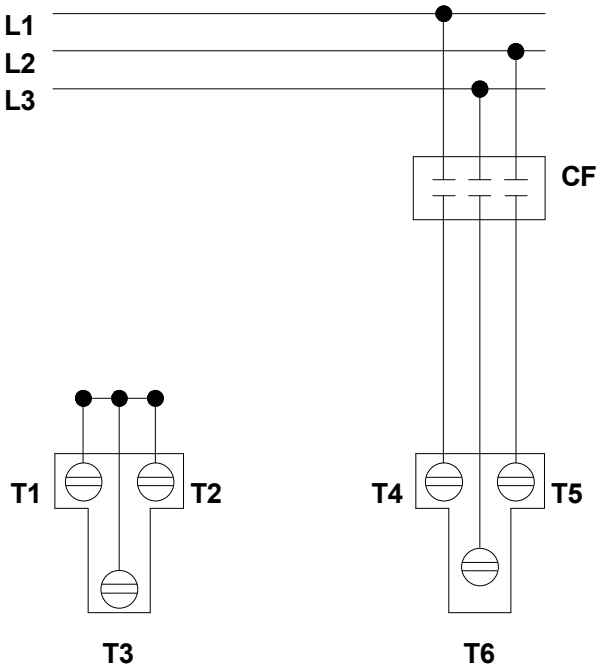


WIRING A TWO-SPEED “G” FOR SINGLE-SPEED OPERATION

LOW SPEED



HIGH SPEED



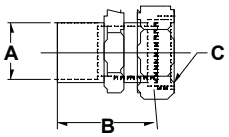
PARTS AND ACCESSORIES FOR "G" SERIES COMPRESSORS

PART NUMBER	DESCRIPTION	MODEL
250507 (344029)*	Discharge Service Valve 7/8"	(094-144)
250508 (344030)*	Suction Service Valve 1 1/8"	(094-124)
250509 (344031)*	Discharge Sweat Adapter 7/8"	(094-144)
250510 (344032)*	Suction Sweat Adapter 1 1/8"	(094-124)
250511	Discharge Seal	(094-294)
250512	Suction Seal	(094-294)
250527 (344035)*	Discharge Service Valve 1 1/8"	(184-294)
250525 (344033)*	Suction Service Valve 1 3/8"	(144)
250526 (344034)*	Suction Service Valve 1 5/8"	(184-294)
250530 (344037)*	Discharge Sweat Adapter 3/4" - 90°	(094-144)
250533 (344038)*	Suction Sweat Adapter 1 3/8" - 90°	(144)
250534 (344039)*	Discharge Adapter 1 1/8"	(184-294)
250529 (344036)*	Suction Adapter 1 3/8"	(144)
309008	Mounting Parts (Set 236203 Grommet Sleeve 236400)	(094-124)
309009	Mounting Parts (Set 236205 Grommet Sleeve 226260)	(144-294)
241711	Crankcase Heater 115V	(094-124)
241712	Crankcase Heater 230V	(094-124)
241713	Crankcase Heater 460V	(094-124)
241714	Crankcase Heater 575V	(094-124)
241703	Crankcase Heater 115V	(144)
241705	Crankcase Heater 460V	(144)
241708	Crankcase Heater 115V	(184-294)
241707	Crankcase Heater 230V	(184-294)
241706	Crankcase Heater 460V	(184-294)
241710	Crankcase Heater 575V	(184-294)
241730	Module 115/230V (Replaces 241380, 241381 and 241680)	(184-294)
241731	Module 24V (Replaces 241379 and 241679)	(184-294)
241732	Module 24V (Replaces 241373 and 241696)	(094-124)
241733	Module 115V (Replaces 241374 and 241697)	(094-124)
241734	Module 230V (Replaces 241375 and 241698)	(094-124)
241744	Module 24V (Replaces 241379, 241679 and 241731)	(184-294)
241745	Module 115/230V (Replaces 241380, 241381, 241680 and 241730)	(184-294)
241770	Module 24V (Replaces 241379, 241679, 241731 and 241744)	(184-294)
241771	Module 120/240V (Replaces 241380, 241381, 241680, 241730 and 241745)	(184-294)
241772	Module 24V (Replaces 241373, 241696 and 241732)	(094-124)
241774	Module 120/240V (Replaces 241374, 241375, 241697, 241698, 241733 and 241734	(094-124)

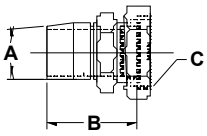
**Note: (344_ _ _) part number includes Teflon seal*

“G” SERIES ROTALOCK ADAPTER INFORMATION

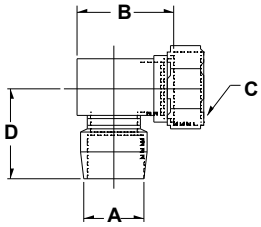
SUCTION ADAPTERS



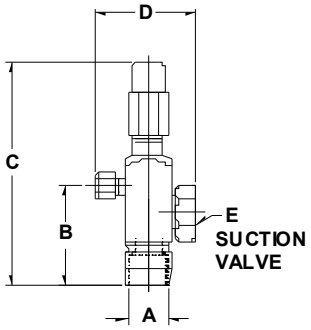
250529



250510

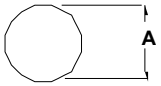


250533



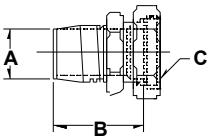
250508
250525
250526

SUCTION SEAL

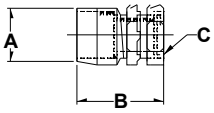


250512

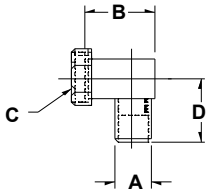
DISCHARGE ADAPTERS



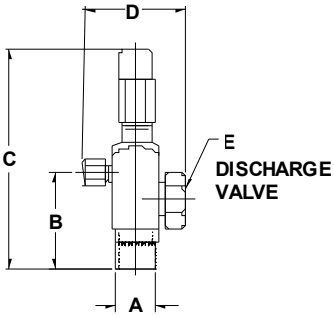
250509



250534

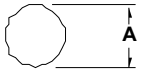


250530



250507
250527

DISCHARGE SEAL



250511

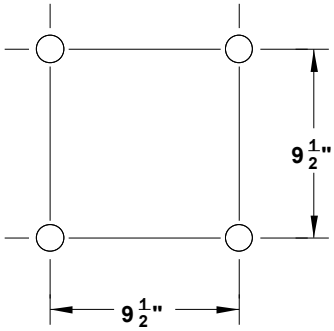
BRISTOL PART NO.	DESCRIPTION	A	B	C	D	E
250508 (344030)*	Suction Valve	1 1/8	3	7 3/16	2 1/2	1 3/4-12 UNF
250511	Discharge Seal	1		For 1 1/4”-12” UNF		
250512	Suction Seal	1 1/2		For 1 3/4”-12” UNF		
250525 (344033)*	Suction Valve	1 3/8	3 5/16	7 3/16	2 1/2	1 3/4-12 UNF
250526 (344034)*	Suction Valve	1 5/8	3 1/2	7 3/16	2 1/2	1 3/4-12 UNF
250529 (344036)*	Suction Adapter Straight	1 3/8	2 1/2	1 3/4-12 UNF		
250510 (344032)*	Suction Adapter Straight	1 1/8	2 3/16	1 3/4-12 UNF		
250533 (344038)*	Suction Adapter 90°	1 3/8	2 3/16	1 3/4-12 UNF	2 3/8	
250507 (344029)*	Discharge Valve	7/8	2 11/32	5 11/32	2 1/64	1 1/4-12 UNF
250527 (344035)*	Discharge Valve	1 1/8	19/32	5 11/32	2 5/32	1 1/4-12 UNF
250509 (344031)*	Discharge Adapter Straight	7/8	1 23/32	1 1/4-12 UNF		
250534 (344039)*	Discharge Adapter Straight	1 1/8	2	1 1/4-12 UNF		
250530 (344037)*	Discharge Adapter 90°	3/4	1 13/16	1 1/4-12 UNF	1 9/16	
NOTE: (344_ _ _) part number includes Teflon seal						

Rotalock Torques Values
Suction rotalock: 1-3/4 x 12 - 190 - 225 Ft. Lbs.
Discharge rotalock: 1-1/4 x 12 - 80 - 100 Ft. Lbs.

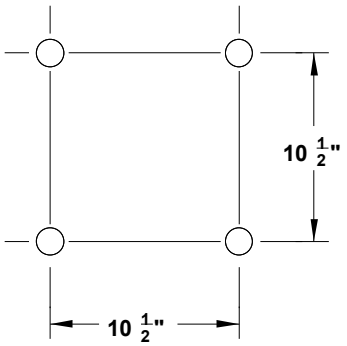
COMPRESSORS WITH SWEAT FITTINGS CANNOT BE ADAPTED TO ROTALOCKS.

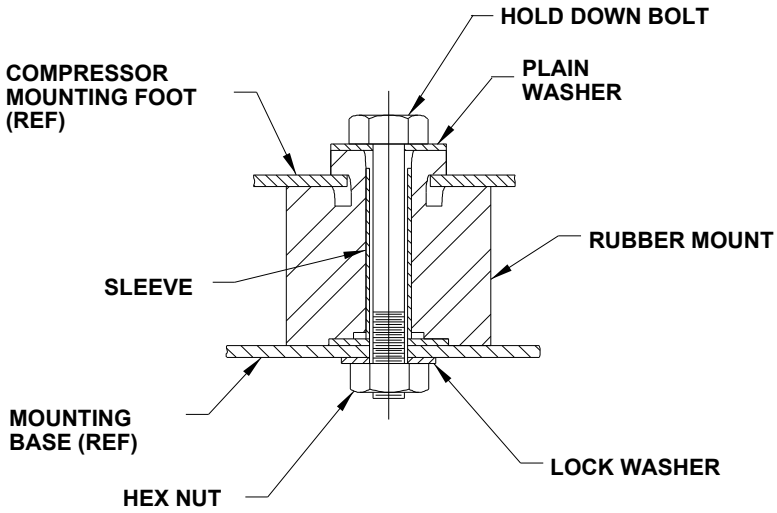
MOUNTING HOLE DIMNSIONS

7 1/2 THRU 10 TON:



12 THRU 24 TON:





NOTE: RUBBER MOUNT IS SHOWN IN NON-COMPRESSED FORM. TIGHTEN HOLD DOWN BOLT UNTIL BOTTOMED-OUT AGAINST SLEEVE.

COMPRESSOR HOUSING TILT ANGLE

094 to 144 (7-1/2 to 12 ton, 12” housing) - may be tilted up to 30°
184 to 194 (15 to 24 ton, 14” housing) - may be tilted up to 40°

Note: Under no circumstances should the compressor be tilted permanently.

PED LABEL INFORMATION

Explanation of the European Pressure Equipment Directive (PED) label information (if the compressor is PED-approved):

- The first five digits of the 11-digit serial number give the manufacture and leak test date of the compressor. The first three digits represent the day of the year (for example, 059 = February 28). The next two digits represent the year (for example, 02 = 2002).
- PS is the maximum allowable pressure
- PT is the leak test pressure
- TS (max) is the maximum design temperature
- TS (min) is the minimum design temperature

PRESSURE-TEMPERATURE RELATION CHART

	TEMPERATURE °F						
					R404A	R-407C	
PSIG	R-22	R-502	R-12	134a	Saturated Vap/Liq.	Saturated Vapor	Saturated Liquid
5*	-48	-57	-29	-22	-57	-41.0	**-54.0**
4*	-47	-55	-28	-21	-56	-39.5	**-52.6**
3*	-45	-54	-26	-19	-54	-38.1	**-51.2**
2*	-44	-52	-25	-18	-53	-36.8	**-49.8**
1*	-43	-51	-23	-16	-52	-35.5	**-48.5**
0	-41	-50	-22	-15	-50	-34.2	**-47.2**
1	-39	-47	-19	-12	-48	-31.8	**-44.7**
2	-44	-52	-25	-10	-46	-29.5	**-42.3**
3	-34	-42	-14	-8	-43	-27.2	**-40.1**
4	-32	-40	-11	-5	-41	-25.1	**-37.9**
5	-30	-38	-9	-3	-39	-23.1	**-35.8**
6	-28	-36	-7	-1	-37	-21.1	**-33.8**
7	-26	-34	-4	1	-35	-19.3	**-31.9**
8	-24	-32	-2	3	-33	-17.5	**-30.1**
9	-22	-30	0	5	-32	-15.7	**-28.3**
10	-20	-29	2	7	-30	-14.0	**-26.6**
11	-19	-27	4	8	-28	-12.4	**-24.9**
12	-17	-25	5	10	-27	-10.8	**-23.3**
13	-15	-24	7	12	-25	-9.2	**-21.7**
14	-14	-22	9	13	-23	-7.7	**-20.1**
15	-12	-20	11	15	-22	-6.3	**-18.6**
16	-11	-19	12	16	-20	-4.8	**-17.2**
17	-9	-18	14	18	-19	-3.5	**-15.8**
18	-8	-16	15	19	-18	-2.1	**-14.4**
19	-7	-15	17	21	-16	-0.8	**-13.0**
20	-5	-13	18	22	-15	0.5	**-11.7**
21	-4	-12	20	24	-14	1.8	**-10.4**
22	-3	-11	21	25	-12	3.0	**-9.2**
23	-1	-9	23	26	-11	4.2	**-7.9**
24	0	-8	24	27	-10	5.4	**-6.7**
25	1	-7	25	29	-9	6.6	**-5.5**
26	2	-6	27	30	-8	7.7	**-4.3**
27	4	-5	28	31	-6	8.9	**-3.2**
28	5	-3	29	32	-5	10.0	**-2.1**
29	6	-2	31	33	-4	11.0	**-1.0**
30	7	-1	32	35	-3	12.1	**0.1**
31	8	0	33	36	-2	-13.2	**1.2**
32	9	1	34	37	-1	14.2	**2.2**
33	10	2	35	38	0	15.2	**3.3**
34	11	3	37	39	1	16.2	**4.3**
35	12	4	38	40	2	17.2	**5.3**
36	13	5	39	41	3	18.1	**6.3**
37	14	6	40	42	4	19.1	**7.2**
38	15	7	41	43	5	20.0	**8.2**
39	16	8	42	44	6	20.9	**9.1**
40	17	9	43	45	7	21.8	**10.1**
42	19	11	45	47	8	23.6	**11.9**
44	21	13	47	49	10	25.4	**13.6**
46	23	15	49	51	12	27.1	**15.4**
48	24	16	51	52	14	28.7	**17.0**
50	26	18	53	54	16	30.3	**18.7**
52	28	20	55	56	17	31.9	**20.3**
54	29	21	57	57	19	33.4	**21.9**

	TEMPERATURE °F						
					R404A	R-407C	
PSIG	R-22	R-502	R-12	134a	Saturated Vap/Liq.	Saturated Vapor	Saturated Liquid
56	31	23	58	59	20	34.9	**23.4**
58	32	24	60	60	22	36.4	**24.9**
60	34	26	62	62	23	37.8	**26.3**
62	35	27	64	64	25	39.2	**27.8**
64	37	29	65	65	26	40.6	**29.2**
66	38	30	67	66	27	42.0	**30.6**
68	40	32	68	68	29	43.3	**31.9**
70	41	33	70	69	30	44.6	**33.3**
72	42	34	71	71	32	45.9	**34.6**
74	44	36	73	72	33	47.8	**36.5**
76	45	37	74	73	34	48.4	**37.1**
78	46	38	76	75	35	49.6	**38.4**
80	48	40	77	76	37	50.8	**39.6**
85	51	43	81	79	40	53.7	**42.6**
90	54	46	84	82	42	56.5	**45.4**
95	56	49	87	85	45	59.2	**48.2**
100	59	51	90	88	48	61.8	**50.9**
105	62	54	93	90	50	64.3	**53.5**
110	64	57	96	93	**52**	66.7	**56.0**
115	67	59	99	96	**55**	69.1	**58.4**
120	69	62	102	98	**57**	71.4	**60.8**
125	72	64	104	100	**59**	73.6	**63.0**
130	74	67	107	103	**62**	75.8	**65.3**
135	76	69	109	105	**64**	77.9	**67.5**
140	78	71	112	107	**66**	80.0	**69.6**
145	81	73	114	109	**68**	82.0	**71.7**
150	83	75	117	112	**70**	83.9	**73.7**
155	85	77	119	114	**72**	85.8	**75.7**
160	87	80	121	116	**74**	87.7	**77.6**
165	89	82	123	118	**76**	89.5	**79.5**
170	91	83	126	120	**78**	91.3	**81.3**
175	92	85	128	122	**80**	93.1	**83.2**
180	94	87	130	123	**82**	94.8	**84.9**
185	96	89	132	125	**83**	96.5	**86.7**
190	98	91	134	127	**85**	98.1	**88.4**
195	100	93	136	129	**87**	99.8	**90.1**
200	101	95	138	131	**88**	101.4	**91.8**
205	103	96	140	132	**90**	102.9	**93.4**
210	105	98	142	134	**92**	104.5	**95.0**
220	108	101	145	137	**95**	107.4	**98.1**
230	111	105	149	140	**98**	110.3	**101.1**
240	114	108	152	143	**101**	113.1	**104.1**
250	117	111	156	146	**104**	115.9	**106.9**
260	120	114	159	149	**107**	118.5	**109.7**
275	124	118	163	153	**111**	122.3	**113.7**
290	128	122	168	157	**115**	126.0	**117.6**
305	132	126	172	161	**118**	129.5	**121.3**
320	136	130	177	165	**122**	132.9	**124.9**
335	139	133	181	169	**126**	136.2	**128.4**
350	143	137	185	172	**129**	139.4	**131.8**
365	146	140	188	176	**132**	142.5	**135.0**

*Inches of Mercury

NOTE: FOR REFRIGERANT BLENDS (R404A, R-407C)

To determine superheat, use saturated vapor values (small figures)
To determine subcooling, use saturated liquid values (BOLD figures)

PRESSURE-TEMPERATURE RELATION CHART

Sat	R22		R410a	
°F	psia	psig	psia	psig
-25	22.08	7.4	37.22	22.5
-24	22.61	7.9	38.06	23.4
-23	23.15	8.5	38.91	24.2
-22	23.70	9.0	39.79	25.1
-21	24.26	9.6	40.68	26.0
-20	24.83	10.1	41.58	26.9
-19	25.42	10.7	42.50	27.8
-18	26.01	11.3	43.44	28.7
-17	26.61	11.9	44.39	29.7
-16	27.23	12.5	45.36	30.7
-15	27.85	13.2	46.34	31.6
-14	28.49	13.8	47.34	32.6
-13	29.14	14.4	48.36	33.7
-12	29.80	15.1	49.40	34.7
-11	30.47	15.8	50.46	35.8
-10	31.15	16.5	51.53	36.8
-9	31.84	17.1	52.62	37.9
-8	32.55	17.9	53.73	39.0
-7	33.27	18.6	54.85	40.2
-6	34.00	19.3	56.00	41.3
-5	34.74	20.0	57.16	42.5
-4	35.49	20.8	58.35	43.7
-3	36.26	21.6	59.55	44.9
-2	37.04	22.3	60.77	46.1
-1	37.83	23.1	62.01	47.3
0	38.64	23.9	63.27	48.6
1	39.46	24.8	64.56	49.9
2	40.29	25.6	65.86	51.2
3	41.14	26.4	67.18	52.5
4	42.00	27.3	68.52	53.8
5	42.87	28.2	69.89	55.2
6	43.76	29.1	71.27	56.6
7	44.66	30.0	72.68	58.0
8	45.57	30.9	74.11	59.4
9	46.50	31.8	75.56	60.9
10	47.45	32.7	77.03	62.3
11	48.40	33.7	78.53	63.8
12	49.38	34.7	80.05	65.4
13	50.36	35.7	81.59	66.9
14	51.37	36.7	83.15	68.5
15	52.38	37.7	84.74	70.0
16	53.42	38.7	86.35	71.7
17	54.47	39.8	87.98	73.3
18	55.53	40.8	89.64	74.9
19	56.61	41.9	91.33	76.6
20	57.71	43.0	93.03	78.3
21	58.82	44.1	94.76	80.1
22	59.94	45.2	96.52	81.8
23	61.08	46.4	98.30	83.6
24	62.25	47.6	100.11	85.4
25	63.43	48.7	101.95	87.3
26	64.62	49.9	103.81	89.1
27	65.83	51.1	105.69	91.0
28	67.06	52.4	107.60	92.9
29	68.30	53.6	109.54	94.8
30	69.57	54.9	111.51	96.8
31	70.85	56.1	113.50	98.8
32	72.14	57.4	115.52	100.8
33	73.46	58.8	117.57	102.9
34	74.79	60.1	119.65	105.0
35	76.14	61.4	121.75	107.1
36	77.51	62.8	123.89	109.2
37	78.90	64.2	126.05	111.4
38	80.31	65.6	128.24	113.5
39	81.73	67.0	130.46	115.8

Sat	R22		R410a	
°F	psia	psig	psia	psig
40	83.19	68.5	132.71	118.0
41	84.64	69.9	134.99	120.3
42	86.12	71.4	137.30	122.6
43	87.62	72.9	139.64	124.9
44	89.15	74.5	142.01	127.3
45	90.69	76.0	144.41	129.7
46	92.25	77.6	146.85	132.2
47	93.83	79.1	149.31	134.6
48	95.43	80.7	151.81	137.1
49	97.05	82.4	154.33	139.6
50	98.69	84.0	156.89	142.2
51	100.36	85.7	159.48	144.8
52	102.04	87.3	162.11	147.4
53	103.74	89.0	164.77	150.1
54	105.47	90.8	167.46	152.8
55	107.22	92.5	170.18	155.5
56	108.98	94.3	172.94	158.2
57	110.77	96.1	175.73	161.0
58	112.59	97.9	178.56	163.9
59	114.42	99.7	181.42	166.7
60	116.27	101.6	184.32	169.6
61	118.15	103.5	187.25	172.6
62	120.05	105.4	190.21	175.5
63	121.98	107.3	193.22	178.5
64	123.92	109.2	196.25	181.6
65	125.89	111.2	199.33	184.6
66	127.88	113.2	202.44	187.7
67	129.90	115.2	205.59	190.9
68	131.93	117.2	208.77	194.1
69	134.00	119.3	211.99	197.3
70	136.08	121.4	215.25	200.6
71	138.19	123.5	218.55	203.9
72	140.32	125.6	221.88	207.2
73	142.48	127.8	225.26	210.6
74	144.66	130.0	228.67	214.0
75	146.87	132.2	232.12	217.4
76	149.10	134.4	235.61	220.9
77	151.36	136.7	239.14	224.4
78	153.64	138.9	242.71	228.0
79	155.95	141.3	246.32	231.6
80	158.28	143.6	249.97	235.3
81	160.64	145.9	253.66	239.0
82	163.02	148.3	257.39	242.7
83	165.43	150.7	261.17	246.5
84	167.87	153.2	264.98	250.3
85	170.33	155.6	268.84	254.1
86	172.82	158.1	272.74	258.0
87	175.33	160.6	276.68	262.0
88	177.88	163.2	280.66	266.0
89	180.45	165.7	284.69	270.0
90	183.04	168.3	288.76	274.1
91	185.67	171.0	292.87	278.2
92	188.32	173.6	297.03	282.3
93	191.00	176.3	301.23	286.5
94	193.70	179.0	305.47	290.8
95	196.44	181.7	309.76	295.1
96	199.20	184.5	314.10	299.4
97	202.00	187.3	318.48	303.8
98	204.82	190.1	322.90	308.2
99	207.67	193.0	327.37	312.7
100	210.55	195.9	331.89	317.2
101	213.45	198.8	336.45	321.8
102	216.39	201.7	341.06	326.4
103	219.36	204.7	345.72	331.0
104	222.36	207.7	350.43	335.7

Sat	R22		R410a	
°F	psia	psig	psia	psig
105	225.38	210.7	355.18	340.5
106	228.44	213.7	359.98	345.3
107	231.53	216.8	364.82	350.1
108	234.65	220.0	369.72	355.0
109	237.80	223.1	374.66	360.0
110	240.98	226.3	379.66	365.0
111	244.19	229.5	384.70	370.0
112	247.43	232.7	389.79	375.1
113	250.71	236.0	394.93	380.2
114	254.01	239.3	400.13	385.4
115	257.35	242.7	405.37	390.7
116	260.72	246.0	410.66	396.0
117	264.13	249.4	416.01	401.3
118	267.56	252.9	421.40	406.7
119	271.03	256.3	426.85	412.2
120	274.53	259.8	432.35	417.7
121	278.07	263.4	437.90	423.2
122	281.64	266.9	443.50	428.8
123	285.24	270.5	449.16	434.5
124	288.88	274.2	454.87	440.2
125	292.55	277.9	460.63	445.9
126	296.25	281.6	466.44	451.7
127	299.99	285.3	472.31	457.6
128	303.76	289.1	478.24	463.5
129	307.57	292.9	484.21	469.5
130	311.42	296.7	490.25	475.6
131	315.30	300.6	496.33	481.6
132	319.21	304.5	502.48	487.8
133	323.17	308.5	508.68	494.0
134	327.15	312.5	514.93	500.2
135	331.18	316.5	521.24	506.5
136	335.24	320.5	527.61	512.9
137	339.34	324.6	534.03	519.3
138	343.48	328.8	540.51	525.8
139	347.65	333.0	547.05	532.4
140	351.86	337.2	553.64	538.9
141	356.11	341.4	560.30	545.6
142	360.40	345.7	567.01	552.3
143	364.72	350.0	573.78	559.1
144	369.09	354.4	580.61	565.9
145	373.49	358.8	587.50	572.8
146	377.93	363.2	594.44	579.7
147	382.41	367.7	601.45	586.8
148	386.94	372.2	608.52	593.8
149	391.50	376.8	615.64	600.9
150	396.10	381.4	622.83	608.1
151	400.75	386.0	630.08	615.4
152	405.43	390.7	637.39	622.7
153	410.16	395.5	644.76	630.1
154	414.92	400.2	652.19	637.5
155	419.73	405.0	659.68	645.0
156	424.59	409.9	667.24	652.6
157	429.48	414.8	674.86	660.2
158	434.42	419.7	682.54	667.8
159	439.40	424.7	690.28	675.6
160	444.42	429.7	698.09	683.4
161	449.49	434.8	705.96	691.3
162	454.61	439.9	713.89	699.2
163	459.76	445.1	Critical:	162.5°F
164	464.97	450.3		717.9psia
165	470.21	455.5		
166	475.51	460.8		
167	480.85	466.2		
168	486.23	471.5		
169	491.67	477.0		
170	497.15	482.5		

H22G SERVICE MODEL CROSS REFERENCE TO H*BG, H*NG and H*5G STANDARD MODELS

For application purposes, the information contained within the body of this INSTALLATION AND SERVICE INSTRUCTIONS booklet for the *Standard* models, H*BG, H*NG and H*5G, will apply directly to the “H22G” *USA Service* models which replace them as specified in the cross-reference table below.

USA Service Model	Standard Model
H22G094DBDE	H2BG094DBDE
H22G094DBEE	H2BG094DBEE
H22G094GPDE	H2NG094GPDE
H22G094GPEE	H2NG094GPEE
H22G104DBDE	H2BG104DBDE
H22G104DBEE	H2BG104DBEE
H22G124DBDE	H2BG124DBDE
H22G124DBEE	H2BG124DBEE
H22G124GPDE	H2NG124GPDE
H22G124GPEE	H2NG124GPEE
H22G144DBDE	H25G144DBDE
H22G144DBEE	H25G144DBEE
H22G184DPDF	H2NG184DPDF
H22G184DPEF	H2NG184DPEF
H22G184GPDF	H2NG184GPDF
H22G184GPEF	H2NG184GPEF
H22G204DREF	H2NG204DREF
H22G204FRDF	H2NG204FRDF
H22G244DREF	H2NG244DREF
H22G244FRDF	H2NG244FRDF
H22G244GPDF	H2NG244GPDF
H22G244GPEF	H2NG244GPEF
H22G294DPEF	H2NG294DPEF
H22G294FPDF	H2NG294FPDF